

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

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GARY KOOPMANN, TIMOTHY KIDD and	:	Civ. Action No: 15-cv-07199-JMF
VICTOR PIRNIK, Individually and on Behalf of	:	
All Others Similarly Situated,	:	
	:	
Plaintiffs,	:	<u>CLASS ACTION</u>
	:	
v.	:	
	:	
	:	
FIAT CHRYSLER AUTOMOBILES N.V.,	:	
FCA US, LLC, SERGIO MARCHIONNE,	:	
RICHARD K. PALMER, SCOTT	:	
KUNSELMAN, MICHAEL DAHL, STEVE	:	
MAZURE and ROBERT E. LEE	:	
	:	
Defendants.	:	
	:	

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REBUTTAL EXPERT REPORT OF ANTHONY ANDREONI

October 26, 2018

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## I. Background and Qualifications

1. My name is Anthony Andreoni. I have been employed since 2017 as a Director of Forensics Operations and Senior Mechanical Engineer at Jensen Hughes (formerly CASE Forensics) in Rocklin, California. Jensen Hughes is an engineering and consulting firm with offices worldwide. I am a mechanical engineer by training, and a licensed professional engineer in California, Oregon, Arizona, Washington, Nevada, Idaho, Utah, and Texas. I received my Bachelor of Science in Mechanical Engineering Technology, with emphasis in CAD/CAM from California State University in 1991. I received my Master of Business Administration (MBA) from California State University in 2007. I am also 30-year member of the Society of Automotive Engineers (SAE) International and an Automotive Service Excellence (ASE) certified technician (and former automotive technician).

2. I am also a former regulator, supervisor, and engineer for the California Air Resources Board (CARB) and former Regulatory Director for the California Municipal Utilities Association, where I provided regulatory public comments, compliance assistance and testimony to California agencies on behalf of a number of California energy and water municipalities, such as for the Sacramento Municipal Utility District (SMUD) and the Los Angeles Water and Power Department (LADWP). From 2010 to 2015, I was the Director of Regulatory Affairs at the California Municipal Utilities Association. From 2007 to 2010, I was the Chief of the Research & Economics Studies Branch in the Research Division at CARB. From 2005 to 2007, I was the Manager of the Zero Emissions Vehicle (ZEV) Section at CARB. From 1999-2005, I was the Manager in the Process Evaluation Section at CARB. From 1997 to 1999, I was a Lead Engineer at CARB in the Research Division, and from 1992-1997, I was also a Lead Engineer

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and Project Manager at CARB in the Monitoring and Laboratory Division. Since 2018, I am also an adjunct professor at California State University, Sacramento.

3. My current hourly rate is \$265 per hour for consultation and travel time, and \$400 per hour for deposition and court testimony. My compensation is not contingent on the outcome of this litigation.

## II. Assignment

4. I have been retained by Counsel for Plaintiffs in this matter to review and respond to certain opinions set forth in the Expert Report of Daniel Esty (“Esty Report”) and in the deposition testimony of Daniel Esty (dated October 17, 2018), and in the Expert Report of James M. Lyons (“Lyons Report”) and deposition testimony of James M. Lyons (dated October 16, 2018). More specifically, I have been asked to respond to Professor Esty’s assertion that “*informal norm-setting conversations*” that occur between a regulator and a regulated company, specifically those that are not documented in writing, are sufficient enough to change the requirements of a statute/regulation that applies to the company’s business.

5. Attached to this report are the following exhibits:

- i. A copy of my curriculum vitae, which includes a listing of all publications that I have authored or co-authored within the preceding ten years (Exhibit 1);
- ii. A listing of cases in which I have testified as an expert at trial or by deposition during the past four years (Exhibit 2);
- iii. A listing of material that I considered in forming my opinions (Exhibit 3).

## III. Basis for Opinion

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6. My opinion in this case is based upon my experience as Former Regulatory Director for the California Municipal Utilities Association, a former Supervisor and Engineer at the California Air Resources Board (CARB), my 25 years of experience working as a consultant in the automotive industry, and my review of certain documents and information relevant to this matter.

**IV. Summary of Opinion**

7. It is my opinion that when government regulators wish to communicate concerning the application of a statute or regulation they communicate with the entire industry as a whole, for example, through either formal amendment(s) to the statute or regulation, or through circulars and guidance letters, which are based on the currently approved regulation. While informal conversations between regulators and regulated entities are customary in the many industries regulated by the U.S. EPA and CARB, including the automotive industry, when a regulator takes a position that is contrary to, or that in effect amends the regulation itself, the regulator does so in writing through a formal process that includes all industries affected. I disagree with Professor Esty's opinion that it is industry custom for a regulator to verbally consent to what amounts to a change in the regulation (which may be referred to as an "underground regulation." This term was referenced in the Administrative Procedures Act ("APA"), as part of the California Office of Administrative Law ("OAL"), as unenforceable rules and does not ensure transparency with the public and within the regulated industries), absent anything in writing, and for a regulated entity to in turn rely on an unwritten purported change in regulation which is based upon only informal dialogue and in-person meetings. For one regulated entity to be provided informal information without including the same information

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to other regulated parties creates an unfair advantage, possibly circumventing the enforceable rule in place.

**V. Statutory Regulations and Background**

8. Relevant to my opinions are the following provisions of the Clean Air Act (CAA), 42 U.S.C. §§ 7401-7671q and its implementing regulations:

To obtain a Certification of Conformity (COC), a light-duty vehicle manufacturer must submit a COC application to the EPA for each test group of vehicles that it intends to enter into United States Commerce. 40 C.F.R. § 86.1843-01.

The COC application must include, among other things a list of all AECDs installed on the vehicles. 40 C.F.R. § 86.1844-01(d)(11).

An AECD is ‘any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system. 40 C.F.R. § 86.1803-01.

The COC application must also include ‘a justification for each AECD, the parameters they sense and control, a detailed justification of each AECD that results in a reduction in the effectiveness of the emission control system, and a rationale for why it is not a defeat device. 40 C.F.R. § 86.1844-01(d)(11).

9. In addition to the statute and the regulations, the U.S. EPA issues advisory circulars and guidance letters. These circulars and guidance assist with industry compliance provisions of the rule. Companies can, and do, consult the circulars and guidance in connection with complying with the above statutes, but are also required to meet and understand that the actual regulatory language is the definitive language to follow in meeting the rule requirements.

10. Specifically, as Messrs. Esty and Lyons acknowledge, the U.S. EPA issued various advisory circulars and guidance letters to the industry over multiple years regarding the definition of an auxiliary emission control device (AECD), the required disclosure of AECDs, and defeat devices in the context of the increased use of increasingly complex electronic

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emission control and modulating devices. Esty Report ¶¶ 27-31; Lyons Report, ¶¶ 47, 50, 51, 52, 77. Through these advisory circulars and guidance letters, the U.S. EPA clearly and repeatedly stated that the definition of AECD did not change, that reported AECDs must be evaluated, emission control defeat devices are prohibited, and that any AECDs were required to be disclosed in an application for certification.

11. For example, on December 11, 1972, the U.S. EPA issued Advisory Circular No. 24: “Prohibition of use of Emission Control Defeat Devices”, which defined AECD as “any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purposes of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.” *Id.* p. 1. The Advisory Circular also stated “All AECDs must be described in the manufacturer’s application for certification. … U.S. EPA will determine whether the device is acceptable or whether it is a Defeat Device.” *Id.* p. 3. This advisory and language in the U.S. EPA regulation does not rely on industry to determine if an AECD is allowed, reported, or considered a defeat device.

12. On December 6, 1978, the EPA issued Advisory Circular 24-2, which provided additional guidance, in part, because of “the rapid advance in the introduction of more sophisticated emission control systems, especially those that offer new flexibility in control capability.” *Id.* p. 1. The advisory circular states that “[t]he most obvious example of this new technology has been the rapid introduction of electronic control and modulation devices. It is EPA’s judgment that the application of electronic controls for emission control and other reasons on motor vehicles and engines will increase substantially in the next few years…” *Id.* p. 1. Advisory Circular 24-2 further stated that the “EPA is faced with the task of evaluating electronic control systems which may receive inputs from multiple sensors and control multiple

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actuators that affect the emission control system's performance. It is clear that such emission control systems are AECDs under the definition of A/C 24..." *Id.* p. 2 (emphasis in original). Many of the emission controls introduced by vehicle manufacturers in the late 1970's began using exhaust system catalysts to reduce tailpipe emissions and used more refined spark controls and fuel delivery control systems on Otto cycle, 4-stroke engines (including the use of an oxygen or Lambda sensor).

13. On May 27, 1998, the EPA issued a "Dear Manufacturer" guidance letter as a "Reminder to Include in the Application for Certification a Description of AECDs Which May Reduce the Effectiveness of the Emission Control System." The guidance letter quoted the definition of AECD from the regulations and reminded all manufacturers that each application for certification must include "a detailed description of each Auxiliary Emission Control Device..." *Id.* p. 1.

14. On October 15, 1998, the EPA issued a "Dear Manufacturer" guidance letter, in part, because of "the increased complexity of computer controlled engine management systems, including the various sensors and software associated with these systems, has led to an increase in the number and types of AECDs." The guidance letter emphasized that, consistent with all prior guidance issued, (*id.* p. 2-3), "[m]anufacturers are required to describe all AECDs..." *Id.* p. 5. The guidance letter for all industry manufacturers producing passenger vehicles and trucks specifically discussed the increased reliance on more complex electronic emission control technologies to operate exhaust gas recirculation ("EGR") and/or NOx after treatment devices,

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and that “[m]echanical or electronic elements of design that modify the operation of the EGR or after treatment devices are also AECDs.” *Id.* (emphasis supplied).<sup>1</sup>

15. On April 22, 1999, the U.S. EPA issued another “Dear Manufacturer” guidance letter following the restructuring of the emission certification procedure. Discussing the requirements for an application for certification, the U.S. EPA stated that the application is required to include “A list of all auxiliary emission control devices (AECD) installed on any applicable vehicles including the sensed and controlled parameters.” *Id.* p. 23.

16. On January 19, 2001, the EPA issued another “Dear Manufacturer” guidance letter. The guidance letter repeated the established regulatory definition of AECD and that “[a] manufacturer has a responsibility to describe all AECDs in its application for certification. Thorough disclosure of the presence of such an AECD and its expected impact on emission performance is essential in allowing EPA to evaluate the AECD and determine whether it represents a defeat device. Clearly, any AECD which is not fully identified in the manufacturer’s application for certification and for which emissions impacts are not provided cannot be appropriately evaluated by EPA and therefore cannot be determined to be acceptable.”

*Id.* p. 6-7.

17. On November 24, 2014, the EPA issued another “Dear Manufacturer” guidance letter, signed by Byron Bunker, Director, Compliance Division, Office of Transportation and Air Quality, emphasizing that “EPA expects the certification test group and common section applications to be accurate, complete and comply with applicable reporting requirements.” *Id.* p. 1.

1. Discussing what should be included in the application for certification, under the heading

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<sup>1</sup> While the October 15, 1998 guidance letter specifically addressed issues arising in the context of heavy-duty diesel engines, the U.S. EPA stated “manufacturers of other vehicles or engines should use the discussion of AECDs relating to onboard computers and electronic controls during the certification process, and compliance with the prohibition against defeat devices, because the same regulatory and statutory requirements concerning AECDs and defeat devices apply to these manufacturers as to manufacturers of heavy-duty diesel engines.” *Id.* p. 3.

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“AECD description” the guidance letter requires that the manufacturer “List all auxiliary emission control devices (AECD’s) used on applicable vehicles including the sensed and controlled parameters...” *Id.* p. 21.

18. As discussed above, even as the U.S. EPA acknowledged the increase in the use of complex electronic emissions control and modulation devices between 1972 and 2014, it continued to emphasize that the definition of AECD remained unchanged and that the burden is on the manufacturers to disclose all AECDs and provide a detailed, written description of their functionality in an application for certification. Based on my experience, this is consistent with how regulators communicate to all industries affected by the existing rule and the general compliance requirements. Any interpretation of statutes and regulations relies on reviewing the approved rule, and any changes or modifications needed to the rule would require a full administrative process involving industry and the public. An example of this in California relates to various non-road diesel engines that were not available for sale near 2005 that met a stringent particulate matter (PM) engine emissions standard under the Air Toxic Control Measure (“ATCM”) and the need for a CARB emergency rule to suspend/amend a portion of the rule based on information, research and discussions with industry, and the finding of lack of engines that were available in a certain classes meeting a more stringent PM standard. The engines available did meet a less-stringent PM standard (U.S. EPA Tier 3 or 4 engine emission standard).<sup>2</sup> Changes to the rule followed the APA procedure, and was approved/adopted by CARB, and the industries affected by the rule changes were made aware of rule changes.

19. I further understand that Messrs. Esty and Lyons identify certain emails and testimony suggesting that in May 2012 a meeting took place between employees at FCA and

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<sup>2</sup> <https://www.arb.ca.gov/diesel/ag/documents/regadv080205.pdf>

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staff at the EPA during which FCA proposed a definition of an AECD that differed from the definition in the regulations for purposes of FCA's disclosure in its application for COC, and that FCA understood that the EPA agreed with its disclosure approach and acted accordingly.<sup>3</sup> In Paragraph 67 of the Esty Report Esty states: "In its May 2012 presentation to the EPA, FCA outlined its approach for disclosing AECDs during its application for certification....The EPA indicated during this meeting that it was 'happy with' FCA's understanding of the definition of an AECD. Based on my review of the record in this Action, it is my opinion that FCA reasonably understood that the EPA was comfortable with its approach to disclosing AECDs as presented in May 2012." In Paragraph 88 of the Lyons Report, Lyons states: "Based on my experience it is not unusual for manufacturers to strive for a balance between meeting disclosure obligations while limiting the provision of extraneous or unnecessary information to regulators."

20. I further understand that neither Mr. Esty nor Mr. Lyons in their reports identify any evidence demonstrating that the EPA memorialized in writing the May 2012 meeting or the purported agreement, and there are no emails or other documented communications between FCA and the EPA that confirm this understanding. *See* Lyons Tr. 109:7-10 (Q: Did you see any communications in your review of the record with the EPA in which the EPA agreed to this internal AECD definition? A: I didn't.).

21. It is my opinion that the circumstance outlined above, where an entity has a meeting with a regulator and takes away from it that the regulator has consented to a change in the definition contained in a statute and/or the disclosure requirement set forth in a regulation, is not customary in the industry and is not the sort of thing that is relied upon by companies. Such consent may create a business advantage to a single regulated entity, and without an official

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<sup>3</sup> See Esty Report at ¶¶ 51-51, 66-68; Lyons Report at ¶¶ 81-88.

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written correspondence to all regulated entities, a clear disadvantage exists between other regulated entities in meeting and complying with the rule. In my experience and in my opinion, such an informal meeting with a regulator is insufficient to provide a company with the ability to alter its regulatory compliance behavior in a way that may result in the failure of the company to adhere to the statute or regulation at issue. In other words, custom in any regulated industry, including the automotive industry, does not support alteration of an existing statute or regulation based upon a meeting with a regulator with respect to something so fundamental as a statutory/regulatory definition, and the disclosure requirements under that definition, especially without any follow-up documentation of such a change being issued for all regulated parties.

22. Furthermore, Esty mentions in paragraph 33 of his report, that "...following the Administrative Procedure Act, informal practices and enforcement norms can be – and sometimes are – revised without any formal process or any notice to the regulated community." This goes against the grain of a regulatory process (again, potentially creates an underground rule that is not enforceable by the U.S. EPA) including the need to notice all parties affected by any possible changes or interpretation in the existing rule.

23. Even Professor Esty himself testified that if FCA requested that the U.S. EPA confirm the conversation in writing, the EPA's response would cite the regulation itself, therefore demonstrating that such an informal change to a regulation cannot be relied on:

Q: "Do you know if there is any evidence in this action between FCA and the EPA where the EPA actually states this understanding?"

A: What I would tell you is that the EPA and regulators in general based on my experience as a regulator are not in the business of confirming the specifics that a company might put forward in this regard and there is in fact a hesitation on the part of the regulator to put down in writing or confirm in writing any of these informal discussions for fear that later circumstances will change and they will want to shift the informal guidance that has been provided, a regulatory

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requirement as they have laid them out. So as a matter of practice this is not what the EPA would do.

Q: So if FCA had written to the EPA and said, thanks for meeting with us yesterday, here is our understanding. Do you agree, the EPA wouldn't respond and confirm it because they would be afraid to be bound by it?

A: what they would do is they would respond but there would be a caveat to what they would respond that would in almost all cases simply cite back to the regulations so that there would be a baseline for EPA later saying we didn't specifically say that this was forever going to be our guidance that this would be forever the regulatory requirements in practice. So there is in general an understanding that one doesn't want to move informal dialogue into a formal written exchange.

Q: But doesn't that create a risk for companies that the EPA can then go back on their word and sue the company?

A: There is always a risk in a regulatory world particularly where there is uncertainties but as a matter of practice this is how companies and regulators work together especially where the regulatory reality on the ground involves uncertainty, where the regulations as drafted do not provide sufficient clarity and where there is regulatory priority setting being done by the agency that might sharpen the focus and not cover all of the regulatory requirements that the regulations up above might encompass.

Deposition Transcript of Daniel C. Esty, October 17, 2018, 132: 10-25; 133: 2-6, 9-22, 25; 134: 2-11.

24. Mr. Esty's testimony above demonstrates that the EPA did not confirm, or provide any written approval to FCA, because such informal dialogue at a meeting does not in fact serve to change the law. Again, this could be considered as an "unfair advantage" of one regulated business over another since the industry as a whole is required to meet the U.S. EPA rule as approved, or as amended, with all regulated participants providing input.

25. Mr. Lyons likewise testified that the EPA would not confirm in writing or provide any written approval to FCA's purported understanding, again because as Lyons himself states

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"the regulatory requirement and the policies as stated by the EPA have remained pretty consistent over time." Lyons Tr. 123: 9-12.:

Q: Why is it that, if [FCA and the EPA] had an agreement as to the subject vehicles?

A: There may have been an understanding between the certification representative and people at FCA involved in certification that was general about what they were looking for or not looking for. If something comes to light, especially if it catches the attention of upper management at the EPA, I don't think that those kinds of agreements would continue to be- well, to the extent whether or not in writing, okay, this is what I am looking for, provide this information to me, I will process the certification application, you will get your approval, and you know, we will go on. If something else happens, you know, I don't know.

Q: So you are saying that if the agreement is not in writing, the EPA is basically saying that, okay, you can put this in, but we are not going to say that this doesn't violate the regulation?

A: You know, maybe agreement is too strong a word for what I have experienced in the certification process. You will ask the certification representatives what they want to see. That is what you provide, and then you get your approval.

Q: So there is no understanding that the requirements for enforcement purposes or otherwise for disclosure of AECDs or the definition of a defeat device would change in those circumstances?

A: As I think I have said a number of times today, the regulatory requirement and the policies as stated by EPA have remained pretty consistent over time.

Lyons Deposition Tr. October 16, 2018, 121:25-123:12.

26. Mr. Lyons also confirmed that he was unaware of any instance in which the EPA or CARB ever relieved any manufacturer of a requirement to disclose each AECD.

Q: Have you had any experience where the EPA or CARB have relieved you or your client of either I guess a specific AECD disclosure requirement?

A: As we talked about earlier in the deposition, the information that is required to be submitted has changed over time, but they have never said, you know, you don't have to disclose an AECD. No.

Lyons Tr. 104:22-105:6.

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27. Mr. Lyons also testified that he is unaware of any time that the EPA or CARB has relieved any manufacturer of a regulatory requirement and not put it into writing.

Q: Are you aware of any situation in which EPA or CARB has relieved a manufacturer of some type of obligation that it otherwise would have to comply with, but not put that into writing?

A: Not with respect to a formal regulatory requirement. I don't think so.

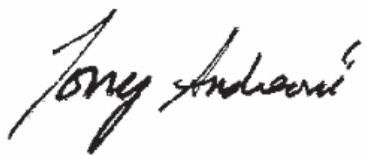
Lyons Tr. 106:19-25.

28. Further, because a definition in a statute or a regulation and what is required to be disclosed, or not disclosed in a COC is something that applies not just to one regulated entity but to the entire industry overall, a regulator or agency needs to communicate this change to the industry overall, not just to one company (as opposed to an analysis of a particular calibration or control feature that is unique to a manufacturer). This makes sense, given that it would not only lead to lack of uniformity in the industry to do otherwise, but it would also be unfair to other industry participants who could not avail themselves to the advantages of the change. Again, an unfair competitive advantage to complying with the rule to only a single business entity, and not the entire industry.

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I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 26, 2018, at Rocklin, California

A handwritten signature in black ink that reads "Tony Andreoni". The signature is fluid and cursive, with "Tony" on top and "Andreoni" below it.

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Anthony Andreoni

## **EXHIBIT 1**



## **ANTHONY ANDREONI, PE, MBA, ASE**

Director, Forensic Operations & Sr. Mechanical Engineer

**Experience:** 26 Years

**Joined JENSEN HUGHES:** 2017

### **Education**

Master of Business Administration,  
California State University, 2007

Bachelor of Science, Mechanical  
Engineering Technology with  
emphasis in CAD/CAM, California  
State University, 1991

### **Registered PE**

Arizona, #62468  
California, #29688  
Idaho, #17160  
Nevada, #024276  
Oregon, #91408PE  
Texas, #124095  
Utah, #10124823-2202  
Washington, #53673

### **Certification**

Automotive Service Excellence (ASE)

### **Associations**

- SAE International
- National & California Society of Professional Engineers (NSPE & CSPE)
- National Association of Professional Accident Reconstruction Specialists (NAPARS)
- California Association of Accident Reconstruction Specialists (CAARS)

### **Contact**

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Anthony Andreoni is the Director, Forensic Operations & Senior Mechanical Engineer, with over 26 years of combined engineering and management experience providing litigation, regulatory support and expert testimony to law firms, insurance companies and industry. He performs and reviews technical and failure analysis investigations, assesses and evaluates best business practices within the auto repair industry, and evaluates codes and standards.

Mr. Andreoni's experience includes product failure analysis, mechanical and automotive engineering, accident investigations and reconstruction, crash event data recorder analysis, mechanical and electrical system analysis, automotive passive restraint assessment, ambient air emissions mitigation, energy analysis, passenger vehicle and heavy-duty truck system analysis, as well as electronic equipment assessment and cost evaluation.

He has specific expertise with automotive brake systems and various automotive and truck components, including mechanical and electronic equipment used in multiple industries. He has provided expert testimony on vehicle component and engine failures, and motor vehicle lemon law related matters.

He is also experienced in alternative vehicle propulsion systems, hydraulic systems, alternative energy, irrigation systems, automotive assessments, piping and plumbing, commercial electronic equipment evaluation, air quality, diesel and gas internal combustion engines, energy and power, environmental control, water intrusion, refrigerants, and fire suppression systems.

Mr. Andreoni is a former supervisor and engineer for the California Air Resources Board, and former Regulator Director for the California Municipal Utilities Association, providing regulatory public comments, compliance assistance and testimony to California agencies. He is also a former automotive technician and a long-time member of SAE International.

### **PROFESSIONAL HIGHLIGHTS**

**Director, Forensic Operations & Sr. Mechanical Engineer, JENSEN HUGHES (formerly CASE Forensics), San Leandro, CA, 2017 to present.**  
Performing vehicle and large truck component failure analysis, engineering, investigations, accident reconstruction and crash data analysis for multiple insurance and legal clients. Investigate and evaluate multiple types of product defects, water intrusion and piping/tubing failure analysis, vehicle fire cause analysis, renewable energy production assessments, advanced vehicle technology evaluation, lemon-law cases, California regulatory compliance and best business practices, equipment replacement cost analysis, and assess commercial and residential equipment losses.

**PROFESSIONAL HIGHLIGHTS (CONTINUED)**

**Adjunct Professor, California State University, Sacramento, 2018.** Operations Management 101 class for the College of Business.

**Senior Project Engineer, Envista Forensics (formerly PT&C|LWG Forensic Consulting Services), Northern CA, 2015 to 2017.** Provided failure analysis for multiple insurance and legal clients covering various applications in automobiles, accident investigation/reconstruction, crash data retrieval, and passenger vehicle and heavy-duty truck crash analysis, water supply and waste systems, commercial electronic equipment, renewable power, and other industrial & power related equipment failures.

**Consulting Engineer, A<sup>2</sup> Consulting Engineers, Rocklin, CA, 1997 to 2015.** Provided forensic engineering services for automobile accident investigations, reconstruction, and component failure analysis. Perform failure analysis on vehicle brake systems, trailer brake failure, passive restraint systems, vehicle event data recorder interrogation and data analysis (Bosch Crash Data Retrieval certified analyst), air bag module retrieval, motorcycle tire failure and vehicle suspension system analysis, auto repair industry best business practice evaluation, and vehicle emissions regulatory compliance assessment and testing/analysis.

**Director of Regulatory Affairs, California Municipal Utilities Association – CMUA, Sacramento, CA, 2010 to 2015.** Tracked, identified and analyzed regulatory and policy efforts from key energy and water agencies while working closely with multiple association members, committees, and legal counsel on AB32, energy efficiency, renewable power, electric vehicle infrastructure and delta water conveyance. Testified and provided written public comments to multiple California State agencies on behalf of municipal utility members.

**Chief of the Research & Economics Studies Branch in the Research Division, California Air Resources Board, Sacramento, CA, 2007 – 2010.** Managed branch operations, including regulatory and human resource development for the economics, the greenhouse gas reduction strategy and the agency technical & law library sections. Provided leadership on climate change studies, ozone depleting substances such as refrigerants, the renewable energy standard, and high Global Warming Potential source mitigation. Directed a small wind power study for the Cal-EPA building.

**Manager of the Zero Emissions Vehicle (ZEV) Section, California Air Resources Board, Sacramento, CA, 2005 – 2007.** Reviewed technology development for fuel-cell vehicles, battery electric vehicles, hydrogen internal combustion engine powered vehicles and hybrid-electric vehicles. Worked closely with auto industry representatives. Developed and implemented a \$13M Alternative Fuel Incentive Program to increase alternative vehicle technology research and consumer use.

**Manager in the Process Evaluation Section, California Air Resources Board, Sacramento, CA, 1999 – 2005.** Managed multiple projects that focused on reducing air emissions from Transport Refrigeration Unit diesel engines, agricultural engines, automotive consumer products, metal melting facilities, and inorganic lead sources. Provided expert testimony to the Board and a Select Senate Committee regarding automotive brake systems, agricultural diesel pump engines and air pollution issues at solid waste landfills.

**Lead Engineer, California Air Resources Board, Sacramento, CA, 1997 – 1999.** Managed multiple mobile source emissions research projects, and Project Manager for the Innovative Clean Air Technologies (ICAT) program, funding \$1M annually for new emission control technology development. A technical expert on emission control technologies for both mobile and stationary source applications.

**Lead Engineer & Project Manager, California Air Resources Board, Sacramento, CA, 1992 – 1997.** Managed multiple ambient air pollution monitoring special studies. Provided engineering and design expertise on the construction of two mobile air monitoring vehicles. Redesigned a collection system and a new metal piercing adapter used to collect propellants from metal aerosol containers following ASTM D 3074-94 and ARB Method 310. Designed, analyzed and evaluated HVAC requirements, insulation specifications, meteorology towers, and power requirements for stationary and mobile ambient air monitoring stations. Provided statistical analysis on air monitoring data.

**Lead Technical Editor of CD-ROM, Alldata Corporation, Elk Grove, CA, 1991 – 1992.** Published automotive diagnostic material. Provided direction to the General Motors (GM) data capture team, and assisted team members in researching and reviewing new automotive diagnostic and testing material.

**Student Engineer, State of California, Bureau of Automotive Repair (BAR), Sacramento, CA, 1990 – 1991.**

Researched pre-1984 automotive engine and emission control system specifications. Performed computer software testing and training on BAR-90 Smog Check analyzers. Provided design changes to the BAR test engine platform used for experimental emissions research.

**CONTINUING EDUCATION AND TRAINING**

- Accessing and Interpreting Heavy Vehicle Event Data Recorders
- Accident Scene Investigation
- Advanced Strategies for Investigating HVAC Failures
- Air Brake Systems Training
- Automobile Technician Training
- Bendix ADB22X Introduction, Inspection, and Guide Pin Service Module
- Crain Claims: Damages, Repairs, Cause & Origin, and Special Cases
- CSST Fire Investigation Claims
- Determining Liability in Electrical Generation, Distribution, and Transmission Failures
- Electrostatic Discharge (ESD): The Silent Killer
- Energy Claims in the Global Market
- Equipment Failures Related to Wind Energy
- Food Processing Facility Losses
- General Procedures for Failure Analysis
- Introduction to NFPA 25
- Lithium Batteries and Subrogation
- Medical Equipment
- Most Difficult Questions for Experts
- Spoliation of Evidence
- Successful Product Liability Investigations
- The End of the World as We Know It: How Solar Storms Can Impact the Insurance Industry
- The Litigation Process
- Vehicle Accident Reconstruction

**NOTABLE PUBLICATIONS AND PRESENTATIONS**

Andreoni, A, Lee, Felix, "Products, Appliances, Vehicles and Systems – Failure Analysis with Case Studies," Combined Claims Conference (CCC), Orange County, California, March 7, 2018.

Andreoni, A., "Advanced Accident Reconstruction – Airbag Module Analysis and Demonstration," OneBeacon Insurance, Englewood, CO, June 2017.

Andreoni, A., "Update on California State Regulatory Activities on Energy & Water sectors," Annual CMUA Conferences, 2010-2015.

Andreoni, A., "Market Evaluation of Plug-in Hybrid Electric Vehicles," Master's Degree Thesis. California State University, Sacramento, California, 2007

Andreoni, A., "An Update on the California Zero Emission Vehicle Regulation," The 7th International Advanced Automotive Battery & Ultracapacitor Conference, Long Beach, California, May 2007

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Andreoni, A., Ayala, A., "Diesel Emission Control Technology Developments in California," U.S. Department of Energy 11th Annual Diesel Engine Emission Reduction Conference, Chicago, Illinois, August 2005

Andreoni, A., "Report to the Board on an Emergency Regulation: Availability of Stationary Engines (less than 175 hp) Meeting the 0.15 g/bhp-hr. Particulate Matter (PM) Standard," Sacramento, CA, March 2005

Anthony Andreoni, P.E, Director, Forensic Operations & Sr. Mechanical Engineer

JENSEN HUGHES

Andreoni, A., "Reduction of Particulate Matter and Other Emissions from Transport Refrigeration Units," EPRI Regional Conference, Sacramento, CA, September 2003.

Andreoni, A., "Public Hearing to Consider the Proposed Control Measure for Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities," San Diego, CA, September 2003

White, J.J., Andreoni, A., Carroll, J.N., "Three-Way Catalyst Technology for Off-Road Equipment Engines", SAE Paper 1999SETC-87, 1999

Andreoni, A., Bloudoff, D., Shahinian, G., "Fresno Special Purpose Monitoring Report: Parallel and Saturation Studies for Carbon Monoxide," ARB Report, June 1994

## **EXHIBIT 2**

**ANTHONY ANDREONI – TESTIMONY LIST**

<b>Deposition</b>	<b>Trial</b>	<b>Party</b>	<b>Venue</b>	<b>Case Caption/Contact</b>
12/16/2014		P	County of SF	<p>Crawford v. BMW NA. No. CGC13535242</p> <p><b>Contact:</b> Mark Romano &amp; Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990</p>
1/13/2015		D	Sacramento	<p>Hays v. Van Every, et. Al No. 34-2013-00141729</p> <p><b>Contact:</b> Gale Kono, Law office of David A. Wallis, for Nationwide Insurance konog@nationwide.com</p>
2/13/2015		D	Fresno	<p>Pederson v. Hoole, San Joaquin Glass, et. Al No. 13CECG02591MBS</p> <p><b>Contact:</b> Victoria M. Yamamoto Counsel Employees of Liberty Mutual Group, Inc Sacramento Legal Yempuku, Wetters &amp; McNamara 2180 Harvard Street, #375 Sacramento, CA 95815 (916) 649-8333, X16327 Phone (916) 830-3457, Direct</p>

Deposition	Trial	Party	Venue	Case Caption/Contact
12/16/2015		P	Orange County	Zaretski v. Jaguar Land Rover NA, LLC No. 30-201400754515-CU-BC-CJC <b>Contact:</b> Mark Romano & Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990
8/29/2017		D	Fresno	Pederson v. Hoole, San Joaquin Glass, et. Al No. 13CECG02591MBS <b>Contact:</b> Victoria M. Yamamoto Counsel Employees of Liberty Mutual Group, Inc Sacramento Legal Yempuku, Wetters & McNamara 2180 Harvard Street, #375 Sacramento, CA 95815 (916) 649-8333, X16327 Phone (916) 830-3457, Direct
05/16/2018		P	Alameda County	Nooraei v BMW NA No. HG16 826302 <b>Contact:</b> Mark Romano & Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990

<b>Deposition</b>	<b>Trial</b>	<b>Party</b>	<b>Venue</b>	<b>Case Caption/Contact</b>
05/24/2018		P	U.S. District Court, Southern District of California	Alan Freas Jr. v BMW NA No. 3:17-CV-1761-H-AGS <b>Contact:</b> Mark Romano & Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990
	06/7/2018	P	Alameda County	Nooraei v BMW NA No. HG16 826302 <b>Contact:</b> Mark Romano & Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990
	06/13/2018	P	Alameda County	Nooraei v BMW NA No. HG16 826302 <b>Contact:</b> Mark Romano & Tim Whelan, Romano Stancroff PC 360 N. Sepulveda Blvd., Suite 1010 El Segundo, CA 90245 Tel: (310) 477-7990

State Administrative Hearings	Admin Hearing	Party	Venue	Case Caption Case No./ Regulation
4/11/2013	No	D	San Diego	<p>West Automotive &amp; Transmission, Bureau of Automotive (BAR) OAH No.: 2012041125</p> <p>79112-54, written declaration, reply for motion to compel discovery</p> <p><b>Contact:</b> Steve Simas, Simas &amp; Associates, Sacramento Office, 3835 N Freeway Blvd., Suite 228, Sacramento CA 95834. 916.789.9800</p>
<b>California Air Resources Board</b>				
4/27/2000	Yes	ARB	San Diego	Chlorinated Cleaners for Auto Maintenance & Repair State Rule
2/26/2004	Yes	ARB	Sacramento	Transport Refrigeration Unit - Diesel Engines State Rule
<b>California Air Resources Board</b>				
5/26/2005	Yes	ARB	Sacramento	Amendments to the Stationary Engine Rule for Ag State Rule
12/9/2009	Yes	ARB	Sacramento	Stationary Refrigerant Rule State Rule
12/16/2011	Yes	CMUA	Sacramento	Low-Carbon Fuel Standard (LCFS) Amendments State Rule

<b>State Administrative Hearings</b>	<b>Admin Hearing</b>	<b>Party</b>	<b>Venue</b>	<b>Case Caption Case No./ Regulation</b>
6/26/2012	Yes	CMUA	Sacramento	AB 32 Cap & Trade Program Amendments Written Testimony - State
2/20/2014	Yes	CMUA	Sacramento	AB 32 Scoping Plan State Plan
<b>California Energy Commission</b>				
3/23/2012	Yes	CMUA	Sacramento	Biomethane & Renewables Eligibility Eligibility Guidance
6/11/2013	Yes	CMUA	Sacramento	Renewables Portfolio Standard (RPS) State Rule
4/8/2015	Yes	CMUA	Sacramento	Water fixtures under Title 20 – amendments State Standards

Note: ARB is the California Air Resources Board. CMUA is the California Municipal Utilities Association

**Exhibit 3**

**List of Materials Considered**

**Case Materials**

Amended Expert Rebuttal Report of Daniel C. Esty, October 2, 2018

Deposition Transcript of Daniel C. Esty, October 17, 2018

Expert Rebuttal Report of James M. Lyons, September 26, 2018

Deposition Transcript of James M. Lyons, October 16, 2018

**Statutes and Regulations**

42 U.S.C. §7401-7671q

40 C.F.R. § 86.1843-01

40 C.F.R. § 86.1844-01(d)(11)

40 C.F.R. § 86.1803-01

California Air Resources Board, August 2005 Regulatory Advisory: Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM)<sup>1</sup>

**EPA Guidance Letters and Advisory Circulars<sup>2</sup>**

EPA Advisory Circular No. 24, December 11, 1972

EPA Advisory Circular No. 24-2, December 6, 1978

EPA “Dear Manufacturer” Guidance Letter, October 15, 1998

EPA “Dear Manufacturer” Guidance Letter, April 22, 2999

EPA “Dear Manufacturer” Guidance Letter, January 19, 2001

EPA “Dear Manufacturer” Guidance Letter, November 24, 2014

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<sup>1</sup> Available at: <https://www.arb.ca.gov/diesel/ag/documents/regadv080205.pdf>

<sup>2</sup> All EPA Guidance Letter and Advisory Circulars are available at: <https://www.epa.gov/vehicle-and-engine-certification/guidance-letters-and-advisory-circulars-vehicle-engine-and>